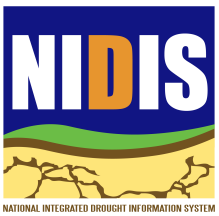
Joint Federal and State National Integrated Drought Information System (NIDIS) Preplanning Meeting Report

Scoping Pilot Drought Early Warning Information Activities in California

February 17, 2011, Sacramento, CA



Overview

National Integrated Drought Information System (NIDIS) pilot activities within the state of California will engage drought information users and producers ranging from state, local, tribal, and federal levels of government, as well as non-governmental organizations (NGOs), individuals and the private sector. The meeting for federal and state agency representatives provided a forum to discuss drought information needs and requirements as part of the preplanning process, to guide decisions on priorities, identify common drought related risks, and to identify key additional partners needed for the NIDIS effort in California. The objectives of the joint state and federal meeting were: 1) to review the goals and mission of NIDIS, 2) to introduce examples of current NIDIS pilot activities, 3) to explore requirements and design for a drought early warning information system pilot in California, 4) to assess criteria for selecting a NIDIS pilot region in California, and 5) to identify other key partners and stakeholders.

The meeting started with a presentation that reviewed NIDIS concepts, governance, activities, the drought portal (http://www.drought.gov), and results of the recent NIDIS Executive Council meeting. There was an overview of the importance of pilot drought early warning systems to the implementation of NIDIS. In Year 1, the pilot drought early warning systems concentrate on the collection of requirements from decision makers, with an eye toward designing the pilot around these specific needs. Priorities lie with assessment of user organization capacity and identification of monitoring gaps. In Year 2, the prototype drought early warning system is implemented, and successes and insights for improvement are documented. The overview was followed by a description of the process used to develop a pilot drought early warning system in the Upper Colorado River Basin, the central role of NIDIS Weekly Drought Webinars in the implementation process, and a summary of lessons learned. The final formal presentation provided an overview of the evolution of the NIDIS pilot drought early warning system in the Southeast, how the pilot is being organized, strategies for engagement, as well as some initial lessons learned. All three presentations resulted in discussions that clarified issues and addressed participant questions. Copies of the three presentations will be made available for download at http://www.drought.gov/portal/server.pt/community/california.

After the three NIDIS introductory presentations, there was a structured round table discussion of drought information needs, resources and priorities in California state agencies. The California Department of Water Resources (DWR) identified four possible opportunities for improved drought data and information: real time assessments of cropping patterns during the growing season, hydroclimatic time series characterization, tree ring-based streamflow reconstructions, and an enhanced drought/hydroclimatic information system for the Klamath Basin. Following the DWR presentation, other state agencies provided their perspectives on drought characteristics, information needs, resources and priorities in California. A broad-based discussion followed that included four general themes: data and monitoring, communication and education, drought planning and water resource management, and natural resource and landscape management. Within these discussions, participants highlighted a number of drought and water supply characteristics of California, ultimately providing an underlying context for identifying information needs across the state. Drought and water supply characteristics of significance in California

include: 1) precipitation is infrequent and often comes in major events resulting in an uneven distribution of water within the annual cycle or even a season, 2) extended dry conditions for weeks, months or even seasons are normal, expected, and are not necessarily indicative of drought, and 3) given the well-plumbed water supply system and multiple potential water sources, drought is discontinuous across the state and characterizing drought for many regions and communities is not a straightforward task. Common needs are categorized below as either scientific and technical, or institutional and coordination.

Scientific and Technical Needs

High priority scientific and technical drought information needs include improved drought monitoring and characterization of past and current droughts in the state, improved forecasts of drought conditions across the state, better coordination and access to hydroclimatic information within river basins, resolving differences among basins, and better understanding and characterization of drought impacts through decision-support tools and assessments. Some specific examples of scientific and technical gaps discussed include:

- A capacity to provide ongoing assessments of change in cropping patterns, especially the extent of fallow land, on a monthly basis, with timely county-level summaries during the growing season
- A consolidated website for accessing river basin hydroclimatic information on the basin scale
- An ability to integrate remote sensing data to fill in-situ data monitoring gaps to better characterize the unique hydroclimatic regimes of California basins
- Additional historical and paleoclimatic data are needed for individual basins to better inform decision-making and forecasting, such as tree-ring reconstruction of Sacramento River streamflow
- Improved time series data extending back several hundred years to characterize hydrologic conditions and status of relevant atmospheric influences over time [(e.g. El Niño Southern Oscillation (ENSO)]
- A capability to depict the differences in hydrologic basins to resolve geographic heterogeneities and provide clear representation of hydrologic conditions at sub-basin scales that can result when large precipitation events fill reservoirs in one basin while large precipitation deficits may prevail in an adjacent basin
- Improved characterization of reservoir management issues (timing of releases and filling) as a context for drought monitoring and forecasting
- Improved understanding of timing and amounts of flows needed for fish sustainability
- Better understanding of impacts and development of appropriate decision-support tools
- Expanded integrated water and climate forecasts over short, medium, and long ranges
- Improved information on forest health, fuel loading, moisture conditions, pest outbreaks and other indicators and information needed to support best use forest management practices
- Improved understanding of the links between drought and coastal landslide impacts on water quality, fisheries, and associated ecosystems

- A comprehensive understanding of drought impacts on hydro-electric energy production including meeting state targets for greenhouse gas emissions
- Improved characterization of drought impacts on natural resources management practices (e.g., wildlife, fisheries, wetland and other habitat restoration, water quality, and reforestation)
- Improved effectiveness of the US Drought Monitor (USDM) as an accurate assessment of drought conditions in California's complex setting to support water management and drought planning
- Improved practical content of the USDM to support regulatory or management decisions
- Improved representation of groundwater in the USDM to support decision making
- Improved capability to predict regional drought severity and duration for use in developing drought outlooks (e.g., the role of Arctic Oscillation/North Atlantic Oscillation may be more important than efforts to improve skill of useful seasonal to interannual prediction capabilities)
- Improved characterization of drought and its impacts as functions of land use, cropping patterns and agricultural responses in monitoring and forecast products

Institutional & Coordination Needs

High-priority drought-related functional and organizational needs included gaining a better understanding of the factors driving regional drought severity and duration, enhanced procedures to identify and overcome barriers preventing coordinated drought response within the state, improved conflict management and perceptions through better communication and dissemination of information, and improved decision support resources to meet local agency/county needs to better respond to drought. Some specific examples of institutional and coordination needs discussed include:

- Enhanced articulation of the factors driving California drought response and action (e.g., delivery mechanisms, compliance and public support)
- Improved explanations of drought conditions that communicates the relative contributions of in-situ hydrologic deficits, external water supply shortages, demand, and the complex water allocation and management requirements
- More effective communication of the underlying information used in making drought declarations (i.e. articulation competing water needs among agriculture, fisheries, reservoir management, ecosystem restoration, urban water supply, and energy production sectors)
- Improved state water planning and drought preparedness by collaborating on long-term planning and forging partnerships that support better decision-making
- Enhanced partnerships with Department of Interior Landscape Conservation Cooperatives (LCCs) and Climate Science Centers (CSCs) to effectively leverage resources for expertise and data on landscape impacts
- Improved water right holder understanding of factors contributing to water shortages by communicating how differences in delivery systems impacts hydrologic regions

- Better use of existing drought response mechanisms and fostering of enhanced information sharing among agencies
- Improved integration of drought information delivery (e.g., monitoring and data aggregation, organizing, combining, and linking data networks)
- Improved consistency in the use and application of information for drought declarations
- Refinement of drought triggers to enact a specific and coordinated response
- Explore mechanisms for better responding to local agency needs given differences in size and responsiveness
- Develop a structured way of delivering economic relief requirements and qualification requirements to aid DWR in local interactions

Framing, Scoping, Developing and Implementing of NIDIS Pilot Activities

The second half of the meeting focused on developing criteria to select potential regions or sectors to focus NIDIS pilot efforts in California, and then to apply these criteria to a short list of potential activities. The group decided that the scoping process should start with, and build upon, previous findings from a September 23, 2010 federal agency meeting discussion of drought information needs, resources, and priorities in California. General insights and recommendations from the September meeting and other previous NIDIS efforts include: to consider tractability, recognizing that there are big water-related problems in California and pilot activities should address critical drought information gaps; to explore new and different issues rather than addressing topics being considered within existing NIDIS pilots; to recognize the need for broader application and transferability of activities to other parts of California and/or the nation; to acknowledge the challenges in sustaining activities for better preparation and ability to respond to drought beyond the length of the pilot; to work within the constraints of a limited funding environment for direct support and use NIDIS support to mobilize and coordinate workshops that foster resource leveraging; to include a stakeholder engagement analysis of how work is currently being done and assess how people could more effectively deal with drought; to consider the needs and expertise of broader community organizations or communities than were represented at the meeting and identify these groups for follow-up input for crafting pilot activities; and to be successful will require a vested interest by a few project leaders willing to take on the task of heavy lifting.

The discussion facilitators presented participants with a synthesis of topic/issue criteria metrics that could be used to identify and discuss candidate areas and/or sectors for regional drought early warning information efforts in California (Table 1). The list was a hybrid of parameters identified during the meeting (denoted with *) as well as at the federal agency meeting in September 2010. Issue-based criteria metrics were used as guidelines for prioritizing regional California activities in an effort to ensure that the suite of activities addresses multiple drought-related needs leading to improved drought preparedness. Recommended pilot criteria metrics need to address:

Table 1. Criteria Metrics

Streamflow	Fisheries*
Groundwater	Hydroelectric*
Water Management	Land Management
Agriculture*	Forestry Management
Wildland Fire Management/Wildfire	Water Quality Connection*
Urban Demands	Potential Impacts*
Information bottleneck	National importance
Institutional bottleneck	Storage-rich
Local commitment and support	Sustainability
Existing resources	Complex but feasible
Different from other pilots	Generalizable lessons
Issues of plumbed systems	Energy
Political salience	Underserved populations, communities
Snow/rain influences	Tourism and recreation
Transboundary contrasts	Population affected
Transferable	Identification of Critical Thresholds
Complex management/distribution of water supplies	

Geography/Regions of Potential California Pilots

The topic/issue criteria brainstorming effort was followed by development of a list of potential geographic areas for a NIDIS pilot drought early warning system in California. Participants submitted ideas in support of specific region(s) and how the proposed regions mapped on to the criteria metrics. A group discussion was used to refine the suggestions, resulting in a list of ten potential areas to focus a NIDIS pilot drought early warning system in California. Identified basins/regions include:

- Klamath River Basin
- (With Trinity Basin as a phase-in)
- Southern CA Municipalities
- Russian River Basin
- Central Valley
- Region where groundwater data are available
- Tulare Lake River Basin
- Tuolumne/San Joaquin
- Clear Lake Cache Creek River Basin
- Feather River Basin

The next step in the effort was to systematically evaluate the ten possible pilot areas in terms of the list of criteria and other considerations brought up during a plenary discussion. After a roundtable discussion of the relative attributes of each area, the list was narrowed to four candidate regions:

- Southern (urban) California
- Central Valley
- Klamath River Basin
- Russian River Basin

Subsequent plenary discussion focused on gauging agency and individual interest in initial California pilot activities within each of the four regions. Participants made it clear that the Central Valley is a complex hydrologic, water management, and allocation region, thus NIDIS activities should be carefully coordinated and well conceived with ample involvement with local water management districts and other important stakeholders. One approach proposed for the Central Valley was to focus on the DWR priority for cropping patterns during the growing season as a non-controversial and non-confrontational effort to improve drought impact information. In comparison to the September 2010 meeting during which participants were hesitant to consider efforts in the Klamath River basin, many participants expressed their support for exploring possible NIDIS pilot activities within the Klamath basin. One discussion focused on the potential for a jointly led River Forecast Center (RFC) and Regional Climate Center (RCC) effort to implement the DWR priority for enhanced access to drought/hydroclimate information in the Klamath basin. There was support for an urban-focused Southern California pilot activity from many participants. Group discussions indicated that follow-up is needed with county and local water districts and agencies to assess viability and support of activities for an urban-focused Southern California pilot. Group discussions concerning the possibility of a Russian River pilot activity revealed that the basin could have a high potential for transferability, and provide a well-contained regional focus that provides opportunity to integrate drought information needs across agricultural, fishery, and reservoir management sectors.

Metrics of Performance or Success

The remaining discussion time was dedicated to exploring potential metrics for tracking progress and measuring the success of California pilot activities. Comments from several participants indicated a concern as to limited documentation regarding stakeholder satisfaction with the other NIDIS pilots. As a result, participants requested that the California pilot be subject to evaluation and assessment of progress. Potential metrics of performance and success recommended by participants featured in Table 2 include:

Table 2. Performance or Success Metrics

Centralized location for information integral to decision-making	Reduced impacts and costs
Improve institutional capacity	Address focused objectives
Did not contribute to stakeholder fatigue but instead responded to informational needs	Questionnaire or survey assessments
Testimonials to the value of affected parties	Ability to communicate uncertainty
Demonstrated quantitative success to motivate sustainability	Provider or drought information has changed decision-making capacity
Demand for expansion	"Return on investment"
Transferability to other regions, basins or sectors	Institutionalizing processes
Tangible products and outcomes that are institutionalized and have state-wide applications	Did activities minimize social and economic impacts of drought?
Comparison of similar basins: one with pilot activity and one without and then assess processes	Quantified measures of increased use of data, products, resources
From an implementation perspective, reducing conflict is a measure of success	Use social networking capabilities to maximize dissemination of relevant information
Defining criteria for failure	Influence content on the national drought portal, in the drought monitor, or the drought outlook

Final Thoughts & Wrap-Up

The meeting was finalized with plans to launch scoping workshops in the four regions aimed to gauge local stakeholder interest, support, and level of involvement in the development and implementation process. An important part of this process will be to identify other key partners and stakeholders who are interested in working as close partners with NIDIS to help guide development and focus on pilot drought early warning activities in California. NIDIS will work with workshop participants on initial planning for scoping workshops.